

In re the Application of:

Serial No. Unassigned

Group Art Unit: Unassigned

Confirmation No.

Filed: Examiner: Unassigned

For: POSITIVE ACTIVE MATERIAL COMPOSITION FOR LITHIUM-SULFUR BATTERY  
AND LITHIUM-SULFUR BATTERY FABRICATED USING SAME

## PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Before examination of the above-identified application, please amend the application as follows:

**IN THE SPECIFICATION:**

Please REPLACE the paragraph beginning at page 3, paragraph [0016], line 26, with the following paragraph:

**[0016]** The binder may further include at least one oxide polymer selected from polyethylene oxide and polypropylene oxide, or an organic mixing solvent capable of dissolving the oxide polymer may be 1,3-dioxolane or acetonitrile.

Please REPLACE the paragraph beginning at page 5, paragraph [0026], line 29, with the following paragraph:

**[0026]** For increasing ionic conductivity of the binder and improving cycle life characteristics, an oxide polymer selected from polyethylene oxide and polypropylene oxide may be further used, or as a suitable solvent to the oxide polymer, acetonitrile or 1,3-dioxolane may be further used. At this time, the mixing ratio between the basic binder and oxide polymer binder is 1 to 9 : 9 to 1 in the weight ratio. Although an oxide polymer binder is further used, the amount of binder in the positive active material composition is not out of the range 5 to 30 percent by weight.

Please REPLACE the table at page 10, Table 2, with the following Table:

	Binder/solvent	Cycle life characteristics (capacity after 100th /capacity at initial) (%)	Initial discharge capacity (mAh/g)
Example 1	PVdF/DMF	11	550
Example 3	PVP/IPA	52	600
Example 2	PVAc/ACN	44	571
Example 4	PVdF/PVAc (1:1)/DMF	50	585
Example 5	PVdF/PVAc/PVP (1:1:1)/DMF	58	594

Please REPLACE the table at page 12, Table 3, with the following Table:

	Binder/ solvent	Cycle life characteristics (capacity after 100th /capacity at initial) (%)	Initial discharge capacity (mAh/g)
Example 2	PVAc/ACN	44	571
Example 6	PVdF/PEO/DMF/DOX	20	576
Example 1	PVdF/DMF	11	550
Example 8	PVP/PEO/IPA/DOX	60	650
Example 3	PVP/IPA	52	600
Example 7	PVAc/PEO/ACN/DOX	54	590

**REMARKS**

This Preliminary Amendment is submitted to improve the form of the specification as originally-filed.


It is respectfully requested that this Preliminary Amendment be entered in the above-referenced application.

If there are any additional fees associated with filing of this Preliminary Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 8/17/01

By:   
Michael D. Stein  
Registration No. 37,240

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Washington, D.C. 20001  
(202) 434-1500

**VERSION WITH MARKINGS TO SHOW CHANGES MADE****IN THE SPECIFICATION:**

Please REPLACE the paragraph beginning at page 3, paragraph [0016], line 26, with the following paragraph:

**[0016]** The binder may further include at least one oxide polymer selected from polyethylene oxide and polypropylene oxide, [and] or an organic mixing solvent capable of dissolving the oxide polymer may be 1,3-dioxolane or acetonitrile.

Please REPLACE the paragraph beginning at page 5, paragraph [0026], line 29, with the following paragraph:

**[0026]** For increasing ionic conductivity of the binder and improving cycle life characteristics, an oxide polymer selected from polyethylene oxide and polypropylene oxide may be further used, [and] or as a suitable solvent to the oxide polymer, acetonitrile or 1,3-dioxolane may be further used. At this time, the mixing ratio between the basic binder and oxide polymer binder is 1 to 9 : 9 to 1 in the weight ratio. Although an oxide polymer binder is further used, the amount of binder in the positive active material composition is not out of the range 5 to 30 percent by weight.

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Example 3	PVP/IPA	52	600
Example 2	PVAc/[CAN]ACN	44	571
Example 4	PVdF/PVAc (1:1)/DMF	50	585
Example 5	PVdF/PVAc/PVP (1:1:1)/DMF	58	594

Please REPLACE the table at page 12, Table 3, with the following Table:

	Binder/ solvent	Cycle life characteristics	Initial discharge capacity
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		(capacity after 100th /capacity at initial) (%)	(mAh/g)
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